

**ANALISIS FILOGENETIKA TANAMAN TIMUN APEL BERBASIS  
METODE RAPD MENGGUNAKAN PRIMER OPA 11 DAN OPA 19**

**SKRIPSI**

diajukan untuk memenuhi syarat untuk memperoleh gelar Sarjana Sains program  
studi Biologi



oleh

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**UNIVERSITAS PENDIDIKAN INDONESIA**

**2020**

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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Universitas Pendidikan Indonesia  
Juni 2020

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# ANALISIS FILOGENETIKA TANAMAN TIMUN APEL BERBASIS METODE RAPD MENGGUNAKAN PRIMER OPA 11 DAN OPA 19

## ABSTRAK

Timun apel merupakan salah satu jenis dari familia Cucurbitaceae. Timun apel diduga merupakan hasil dari persilangan alami antara timun (*Cucumis sativus*) dan melon (*Cucumis melo*). Analisis filogenetika molekuler diperlukan untuk mengetahui hubungan kekerabatan berdasarkan sejarah evolusinya sehingga klasifikasi secara taksonomi dapat diketahui. Penelitian ini bertujuan untuk mengetahui hubungan filogenetika tanaman timun apel. Sampel yang digunakan yaitu bagian daun tanaman timun apel serta beberapa tanaman dari famili Cucurbitaceae lainnya seperti timun, melon, labu siam, dan labu kuning. Penanda molekuler yang digunakan adalah primer acak RAPD. Primer OPA 11 dan OPA 19 merupakan primer hasil seleksi yaitu dapat mengamplifikasi dengan baik yang ditunjukkan dengan banyaknya pita DNA yang terbentuk. Analisis data dilakukan menggunakan perangkat lunak PAUP\*4.0b10 dengan metode maksimum parsimoni. Data terdiri dari matriks DNA hasil PCR RAPD serta sekuens DNA daerah ITS yang diperoleh dari *genebank*. Analisis data dilakukan menggunakan tiga variasi untuk membandingkan hasil. Analisis data yang digunakan diantaranya data hasil PCR RAPD, data sekuens DNA, serta kombinasi data hasil PCR RAPD dan sekuens DNA. Hasil rekonstruksi pohon filogenetik menggunakan data RAPD menunjukkan bahwa timun apel berada pada *clade* yang sama dengan melon, namun belum dapat menjelaskan bahwa timun apel merupakan persilangan melon dengan timun karena timun tidak berada pada *clade* tersebut. Hasil analisis pohon filogenetik pada ketiga data menunjukkan bahwa timun apel berada pada *clade* yang sama dengan melon dengan nilai *bootstrap* 100. Hal ini selaras dengan penelitian sebelumnya bahwa timun apel berkerabat dekat dengan melon. Sehingga dapat diasumsikan timun apel merupakan subspecies atau variasi baru dari melon dan klasifikasi timun apel adalah *Cucumis melo*.

**Kata kunci** : Analisis filogenetika, cucurbitaceae, timun apel, RAPD.

# PHYLOGENETIC ANALYSIS OF APPLE CUCUMBER PLANTS BASED ON RAPD METHOD USING PRIMERS OPA 11 AND OPA 19

## ABSTRACT

Apple cucumber is one of the species of the Cucurbitaceae family. Apple cucumber is thought to be the result of natural hybridization between cucumber (*Cucumis sativus*) and melon (*Cucumis melo*). Molecular phylogenetic analysis is needed to find out the kinship based on its evolutionary history so the taxonomy classification can be known. This study aims to determine the phylogenetic relationship of apple cucumber plants. The samples used were the leaves of the apple cucumber plant and some plants from Cucurbitaceae family such as cucumber, melon, chayote, and pumpkin. The molecular marker used was RAPD. Primers OPA 11 and OPA 19 were the selection primers which able to amplify well, indicated by the number of DNA bands formed. Data analysis was performed using PAUP\*4.0b10 software with the maximum parsimony method. The data consisted of the DNA matrix from RAPD PCR results and DNA sequences of ITS regions obtained from gene banks. The data analysis done by using three variations, which are RAPD PCR results data, DNA sequences data, and a combination of RAPD PCR results data and DNA sequences data, to compare the results. The result of phylogenetic tree reconstruction using RAPD data shows that apple cucumber is in the same clade as melon, however, the result cannot explain that apple cucumber is the result of hybridization between cucumber and melon because cucumber is not in the same clade as either melon and apple cucumber. The result of the phylogenetic tree analysis on the three data shows that apple cucumber is in the same clade as melon with a bootstrap value of 100. This is consistent with previous research that apple cucumber is closely related to melon. Furthermore, it can be assumed that apple cucumber is a subspecies or new variations of melons and the classification of apple cucumber is *Cucumis melo*.

**Keywords:** Phylogenetic analysis, Cucurbitaceae, apple cucumber, RAPD.

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